1. Find the inverse of the function below. Then, evaluate the inverse at $x = 7$ and choose the interval that $f^{-}1(7)$ belongs to.

$$f(x) = e^{x+3} + 3$$

A. $f^{-1}(7) \in [4.3, 4.7]$

B. $f^{-1}(7) \in [4.4, 5.9]$

C. $f^{-1}(7) \in [4.4, 5.9]$

D. $f^{-1}(7) \in [4.3, 4.7]$

E. $f^{-1}(7) \in [-2.8, -1.3]$

---

2. Subtract the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = 3x^2 + 5x + 8 \text{ and } g(x) = \frac{2}{4x + 27}$$

A. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [-9.5, -2.5]$

B. The domain is all Real numbers except $x = a$, where $a \in [-13.75, -4.75]$

C. The domain is all Real numbers less than or equal to $x = a$, where $a \in [-2, 5]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [3.33, 9.33]$ and $b \in [-3.2, -2.2]$

E. The domain is all Real numbers.

---

3. Find the inverse of the function below (if it exists). Then, evaluate the inverse at $x = -10$ and choose the interval that $f^{-}1(-10)$ belongs to.

$$f(x) = \sqrt[3]{2x + 5}$$

A. $f^{-1}(-10) \in [-499.5, -496.5]$

B. $f^{-1}(-10) \in [501.1, 503.1]$

C. $f^{-1}(-10) \in [495.1, 500.2]$

D. $f^{-1}(-10) \in [-503.9, -500.4]$

E. The function is not invertible for all Real numbers.

---

4. Determine whether the function below is 1-1.

$$f(x) = (5x - 35)^3$$

A. Yes, the function is 1-1.

B. No, because the range of the function is not $(-\infty, \infty)$.

C. No, because there is a y-value that goes to 2 different x-values.

D. No, because there is an x-value that goes to 2 different y-values.

E. No, because the domain of the function is not $(-\infty, \infty)$.

---

5. Add the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = \frac{3}{6x + 37} \text{ and } g(x) = x + 7$$

A. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [-6.5, -2.5]$

B. The domain is all Real numbers except $x = a$, where $a \in [-6.17, -2.17]$

C. The domain is all Real numbers less than or equal to $x = a$, where $a \in [0, 3]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [-3.8, 1.2]$ and $b \in [4.33, 8.33]$

E. The domain is all Real numbers.

---

6. Find the inverse of the function below. Then, evaluate the inverse at $x = 10$ and choose the interval that $f^{-}1(10)$ belongs to.

$$f(x) = \ln(x + 4) - 5$$

A. $f^{-1}(10) \in [142.41, 149.41]$

B. $f^{-1}(10) \in [396.43, 399.43]$

C. $f^{-1}(10) \in [3269012.37, 3269019.37]$

D. $f^{-1}(10) \in [1202597.28, 1202600.28]$

E. $f^{-1}(10) \in [3269019.37, 3269022.37]$

---

7. Choose the interval below that f composed with g at $x = -1$ is in.

$$f(x) = -2x^3 + x^2 + 2x \text{ and } g(x) = -x^3 - 2x^2 - 3x - 4$$

A. $(f \circ g)(-1) \in [13, 17]$

B. $(f \circ g)(-1) \in [-16, -6]$

C. $(f \circ g)(-1) \in [-8, -3]$

D. $(f \circ g)(-1) \in [5, 12]$

E. It is not possible to compose the two functions.

---

8. Find the inverse of the function below (if it exists). Then, evaluate the inverse at $x = -15$ and choose the interval that $f^-1(-15)$ belongs to.

$$f(x) = 3x^2 - 4$$

A. $f^{-1}(-15) \in [1.82, 1.95]$

B. $f^{-1}(-15) \in [6.9, 7.22]$

C. $f^{-1}(-15) \in [3.76, 4.2]$

D. $f^{-1}(-15) \in [2.22, 2.55]$

E. The function is not invertible for all Real numbers.

---

9. Choose the interval below that f composed with g at $x = -1$ is in.

$$f(x) = 2x^3 - 2x^2 + 2x + 3 \text{ and } g(x) = x^3 + 2x^2 + 3x$$

A. $(f \circ g)(-1) \in [-18.39, -17.32]$

B. $(f \circ g)(-1) \in [-13.09, -12.75]$

C. $(f \circ g)(-1) \in [-25.46, -22.42]$

D. $(f \circ g)(-1) \in [-21.79, -18.43]$

E. It is not possible to compose the two functions.

---

10. Determine whether the function below is 1-1.

$$f(x) = (3x + 21)^3$$

A. No, because the range of the function is not $(-\infty, \infty)$.

B. No, because there is a y-value that goes to 2 different x-values.

C. No, because there is an x-value that goes to 2 different y-values.

D. Yes, the function is 1-1.

E. No, because the domain of the function is not $(-\infty, \infty)$.

---

11. Find the inverse of the function below. Then, evaluate the inverse at $x = 7$ and choose the interval that $f^-1(7)$ belongs to.

$$f(x) = \ln(x + 2) - 5$$

A. $f^{-1}(7) \in [162750.79, 162754.79]$

B. $f^{-1}(7) \in [-0.61, 7.39]$

C. $f^{-1}(7) \in [143.41, 144.41]$

D. $f^{-1}(7) \in [162753.79, 162764.79]$

E. $f^{-1}(7) \in [8098.08, 8102.08]$

---

12. Multiply the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = \frac{2}{4x + 21} \text{ and } g(x) = \frac{2}{6x - 23}$$

A. The domain is all Real numbers except $x = a$, where $a \in [0.4, 11.4]$

B. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [1, 9]$

C. The domain is all Real numbers less than or equal to $x = a$, where $a \in [-6.67, -2.67]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [-7.25, -4.25]$ and $b \in [0.83, 7.83]$

E. The domain is all Real numbers.

---

13. Find the inverse of the function below (if it exists). Then, evaluate the inverse at $x = 11$ and choose the interval that $f^-1(11)$ belongs to.

$$f(x) = \sqrt[3]{2x + 3}$$

A. $f^{-1}(11) \in [663.3, 664.8]$

B. $f^{-1}(11) \in [664.9, 667.9]$

C. $f^{-1}(11) \in [-664.5, -661.8]$

D. $f^{-1}(11) \in [-669.6, -664.4]$

E. The function is not invertible for all Real numbers.

---

14. Determine whether the function below is 1-1.

$$f(x) = -9x^2 + 15x + 234$$

A. No, because the domain of the function is not $(-\infty, \infty)$.

B. No, because there is an x-value that goes to 2 different y-values.

C. No, because the range of the function is not $(-\infty, \infty)$.

D. Yes, the function is 1-1.

E. No, because there is a y-value that goes to 2 different x-values.

---

15. Add the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = x + 6 \text{ and } g(x) = \frac{1}{4x - 13}$$

A. The domain is all Real numbers except $x = a$, where $a \in [2.25, 6.25]$

B. The domain is all Real numbers less than or equal to $x = a$, where $a \in [-6.4, -2.4]$

C. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [-6.75, -2.75]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [-12.33, 2.67]$ and $b \in [-8.67, -3.67]$

E. The domain is all Real numbers.

---

16. Find the inverse of the function below. Then, evaluate the inverse at $x = 7$ and choose the interval that $f^-1(7)$ belongs to.

$$f(x) = e^{x-4} + 5$$

A. $f^{-1}(7) \in [6.02, 6.21]$

B. $f^{-1}(7) \in [4.66, 4.73]$

C. $f^{-1}(7) \in [7.35, 7.45]$

D. $f^{-1}(7) \in [-3.34, -3.28]$

E. $f^{-1}(7) \in [7.41, 7.5]$

---

17. Choose the interval below that f composed with g at $x = 1$ is in.

$$f(x) = -2x^3 - 2x^2 + 2x \text{ and } g(x) = -2x^3 - 3x^2 + 3x + 1$$

A. $(f \circ g)(1) \in [-1.78, -0.74]$

B. $(f \circ g)(1) \in [2.64, 3.93]$

C. $(f \circ g)(1) \in [-6.26, -5.68]$

D. $(f \circ g)(1) \in [-2.2, -1.72]$

E. It is not possible to compose the two functions.

---

18. Find the inverse of the function below (if it exists). Then, evaluate the inverse at $x = 12$ and choose the interval that $f^-1(12)$ belongs to.

$$f(x) = \sqrt[3]{3x + 4}$$

A. $f^{-1}(12) \in [574, 576.8]$

B. $f^{-1}(12) \in [577.3, 578.8]$

C. $f^{-1}(12) \in [-580.7, -574.7]$

D. $f^{-1}(12) \in [-575.6, -573.9]$

E. The function is not invertible for all Real numbers.

---

19. Choose the interval below that f composed with g at $x = 1$ is in.

$$f(x) = -3x^3 - 2x^2 + 3x + 4 \text{ and } g(x) = x^3 - 2x^2 + 3x$$

A. $(f \circ g)(1) \in [-30, -24]$

B. $(f \circ g)(1) \in [6, 11]$

C. $(f \circ g)(1) \in [-26, -20]$

D. $(f \circ g)(1) \in [-6, 1]$

E. It is not possible to compose the two functions.

---

20. Determine whether the function below is 1-1.

$$f(x) = (4x + 13)^3$$

A. No, because the domain of the function is not $(-\infty, \infty)$.

B. No, because there is an x-value that goes to 2 different y-values.

C. Yes, the function is 1-1.

D. No, because there is a y-value that goes to 2 different x-values.

E. No, because the range of the function is not $(-\infty, \infty)$.

---

21. Find the inverse of the function below. Then, evaluate the inverse at $x = 8$ and choose the interval that $f^-1(8)$ belongs to.

$$f(x) = \ln(x+5) + 2$$

A. $f^{-1}(8) \in [22020.47, 22024.47]$

B. $f^{-1}(8) \in [21.09, 27.09]$

C. $f^{-1}(8) \in [442414.39, 442420.39]$

D. $f^{-1}(8) \in [405.43, 413.43]$

E. $f^{-1}(8) \in [388.43, 399.43]$

---

22. Add the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = \sqrt{6x - 28} \text{ and } g(x) = x + 6$$

A. The domain is all Real numbers except $x = a$, where $a \in [1.17, 5.17]$

B. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [0.67, 5.67]$

C. The domain is all Real numbers less than or equal to $x = a$, where $a \in [-5.5, -0.5]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [-1.67, 4.33]$ and $b \in [-4.2, -3.2]$

E. The domain is all Real numbers.

---

23. Find the inverse of the function below (if it exists). Then, evaluate the inverse at $x = -15$ and choose the interval that $f^-1(-15)$ belongs to.

$$f(x) = \sqrt[3]{3x + 4}$$

A. $f^{-1}(-15) \in [1125.5, 1129.3]$

B. $f^{-1}(-15) \in [1122.7, 1126]$

C. $f^{-1}(-15) \in [-1125.4, -1122.4]$

D. $f^{-1}(-15) \in [-1129, -1126.3]$

E. The function is not invertible for all Real numbers.

---

24. Determine whether the function below is 1-1.

$$f(x) = 9x^2 - 39x - 230$$

A. No, because the domain of the function is not $(-\infty, \infty)$.

B. No, because there is a y-value that goes to 2 different x-values.

C. Yes, the function is 1-1.

D. No, because the range of the function is not $(-\infty, \infty)$.

E. No, because there is an x-value that goes to 2 different y-values.

---

25. Multiply the following functions, then choose the domain of the resulting function from the list below.

$$f(x) = \frac{3}{3x - 16} \text{ and } g(x) = \frac{2}{3x + 16}$$

A. The domain is all Real numbers less than or equal to $x = a$, where $a \in [-6.6, 5.4]$

B. The domain is all Real numbers except $x = a$, where $a \in [-8.25, -4.25]$

C. The domain is all Real numbers greater than or equal to $x = a$, where $a \in [5, 13]$

D. The domain is all Real numbers except $x = a$ and $x = b$, where $a \in [0.33, 6.33]$ and $b \in [-11.33, -1.33]$

E. The domain is all Real numbers.

---

26. Find the inverse of the function below. Then, evaluate the inverse at $x = 4$ and choose the interval that $f^{-}1(4)$ belongs to.

$$f(x) = e^{x+2} + 2$$

A. $f^{-1}(4) \in [-0.7, 2.7]$

B. $f^{-1}(4) \in [-3.5, -0.7]$

C. $f^{-1}(4) \in [-0.7, 2.7]$

D. $f^{-1}(4) \in [2.8, 5.5]$

E. $f^{-1}(4) \in [2.8, 5.5]$

---

27. Choose the interval below that f composed with g at $x = -1$ is in.

$$f(x) = -4x^3 - 2x^2 + 4x - 1 \text{ and } g(x) = -2x^3 - 2x^2 - x$$

A. $(f \circ g)(-1) \in [42, 47]$

B. $(f \circ g)(-1) \in [38, 40]$

C. $(f \circ g)(-1) \in [4, 6]$

D. $(f \circ g)(-1) \in [-12, 0]$

E. It is not possible to compose the two functions.

---

28. Find the inverse of the function below (if it exists). Then, evaluate the inverse at $x = 13$ and choose the interval that $f^{-}1(13)$ belongs to.

$$f(x) = \sqrt[3]{5x + 3}$$

A. $f^{-1}(13) \in [438.67, 438.81]$

B. $f^{-1}(13) \in [439.45, 441.34]$

C. $f^{-1}(13) \in [-439.21, -438.65]$

D. $f^{-1}(13) \in [-440.29, -439.8]$

E. The function is not invertible for all Real numbers.

29. Choose the interval below that f composed with g at $x = -1$ is in.

$$f(x) = -2x^3 + 3x^2 + 4x \text{ and } g(x) = 3x^3 - 1x^2 - 2x$$

A. $(f \circ g)(-1) \in [24, 37]$

B. $(f \circ g)(-1) \in [20, 21]$

C. $(f \circ g)(-1) \in [1, 14]$

D. $(f \circ g)(-1) \in [-5, 3]$

E. It is not possible to compose the two functions.

30. Determine whether the function below is 1-1.

$$f(x) = 15x^2 - 56x - 396$$

A. No, because there is a y-value that goes to 2 different x-values.

B. No, because the range of the function is not $(-\infty, \infty)$.

C. No, because there is an x-value that goes to 2 different y-values.

D. No, because the domain of the function is not $(-\infty, \infty)$.

E. Yes, the function is 1-1.